SOME ASPECTS OF THE COLLEGE COURSE IN THE PRINCIPLES OF ECONOMICS, ITS OBJECTIVES CONTENT AND ACHIEVEMENT

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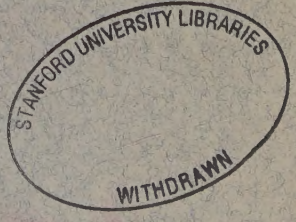

TEACHING THE PRINCIPLES OF ECONOMICS

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A STUDY IN THE TEACHING OF THE PRINCIPLES OF ECONOMICS

I. THE PURPOSE AND CHARACTER OF THE STUDY

In every department of education several questions are constantly recurring in the mind of the instructor and pressing for solution. Regardless of how specialized his field may be, the teacher must view his work not only from the standpoint of the truth and accuracy of the subject matter which he presents, but also in the light of the reactions of his students to his teaching. What shall be taught, how shall it be taught, and to what degree are the students learning the subject matter under discussion are questions with which every teacher is confronted and the answers to which are exceedingly difficult.

Much has been done during the past two decades in the field of elementary and secondary education toward working out scientifically methods of arriving at correct answers to these and similar questions. A host of workers both in the field and in the universities have earnestly set for themselves the task of analyzing the social environment with a view toward answering the question as to what should be taught; of experimenting with various methods of instruction with a view toward discovering which are most economical and effective; and of devising means of measuring results which may be relied upon to express in reasonably accurate terms the degree in which the teacher has succeeded in doing the thing he is trying to accomplish. While much of the labor of these students of education has been misdirected and, perhaps, of little real value, out of it all has appeared an entirely different outlook toward the educative process—a saner and more rational approach, an assurance and professional consciousness on the part of the great body of elementary and secondary teachers, and an intense striving on the part of at least the foremost of these teachers to learn their job of teaching so as to be able to justify their position in society and to

give their pupils the training that will best fit them to live in a democracy. Despite the inherent limitations upon any attempt at the application of rigorous scientific methods to any of the social sciences—limitations not always recognized by workers in these fields—the results of the new methods in the elementary and secondary schools have been such as to justify the prediction that we shall never return to our former haphazard methods of teaching younger children.

To students of elementary and high-school education the foregoing remarks will appear commonplace. Public-school teachers and administrators accept the present so-called "scientific" methods in education and are interested chiefly in improving them. But the higher institutions of learning have been slow in accepting the new methods. The university professor is perhaps naturally conservative. He is interested in a specialized field and has little time to inquire critically into new methods of teaching. Not being thoroughly informed, he is likely to be skeptical of the entire department of education and its works. And yet the problems which the students in the field of education are trying to solve present themselves to the college teacher in the most acute form. Either he attempts to solve them or he refuses to give them more than cursory thought, being content to follow traditional methods. So long as he takes the latter view there is no hope that his particular department will make any serious attempt to discover methods of improving its teaching efficiency. It is only when the college teacher really gives serious attention to the pedagogical problems involved in his work that he learns to appreciate the necessity of systematic—if not scientific—experiment such as the schools of education throughout the country have been practicing for a number of years.

The present study was made specifically with a view to determining if possible what is being accomplished by the present year's work in the principles of economics in the University of Iowa. The course in this institution, however, is similar to that in colleges and universities generally. It is pursued chiefly by sophomores and is presented on the departmental plan, the work being unified by a chairman of the course who also gives some

of the examinations. During the year when the present study was made, Ely's *Outlines of Economics,* fourth edition, was used as a text, supplemented by Williamson's *Readings in Economics* and the *National City Bank Letter.* There was no lecture period, but each instructor met his classes three times a week and by discussion sought to draw out the students and thus to present the material of the course. Grades were based upon daily five- to fifteen-minute quizzes and written examinations, together with the instructors' estimate of the students' ability gained through personal contact in the classroom and elsewhere. The written examinations included three given during each semester and a final examination at the end of the semester's work. The three (departmental) examinations were in the form of the "sentence-answer" type; that is, they were made up of twenty-five to thirty-five questions requiring brief (sentence) answers. An hour was devoted to these examinations. The final examinations were given by the individual instructors. These occupied two hours and were the usual "essay" type. While this plan of conducting the course in Principles of Economics has worked fairly well, it affords no reliable means of judging the success of the course as a whole. Any statement on the part of the instructor as to the degree in which he is successful in teaching his students is of necessity a matter of opinion, and is not necessarily in agreement with the experience of others in the same department. This uncertainty and lack of reliable knowledge of what is being accomplished by the course in Principles of Economics prompted the attempt at a more scientific approach which resulted in the experiment set forth herein.

The attempt to evaluate in definite terms the results of a year's work in economics and to devise means of improving the material and its presentation brought the investigator at once face to face with the task of constructing a test which would serve as a reliable measure of achievement. Since this test was to be given both at the beginning and at the end of the academic year the language employed must of necessity be non-technical in order that it might be understood by students who had no previous training in the subject.

Another important consideration was that of selecting the material to be included in the test. General economics, more than most other sciences, is a matter of "accurate thinking on a common-sense level," and does not involve much knowledge of facts not known to every normal adult required to deal with most economic issues. The essential purpose of the course in the Principles of Economics is conceived to be that of training the student to reason intelligently on public questions of an economic character, and a test which is to measure achievement in the course must necessarily be built with this end in view. It was therefore deemed best to choose material that was not too specialized or minute in detail. However, a certain amount of special information is necessary to intelligent judgment and for purposes of general education and therefore part of the test was made up of questions asking for specific information.

Consideration of the question as to the form of the test brought up the whole matter of objectivity of grading and resulted in considerable experimentation along this line. It was finally decided to throw the test into two sections entirely different in type. Section I was composed of twenty-five questions of the multiple-response type, asking chiefly for information. This part of the test required ten minutes to answer. Section II of the test consisted of twenty-five popular economic fallacies briefly and concisely stated. The student was asked to decide whether the propositions as stated were true or false. If he decided that a particular proposition was true, no comment was necessary, but if he recognized it as false he was asked to state briefly (in a sentence or two) why he regarded it as false.

In scoring the test, each question of Section I answered correctly received a score of one. Several questions carried half-credit for certain answers. The total possible score was therefore twenty-five. On Section II, five grades were assigned. A proposition marked true was given zero; unanswered counted one; marked false and accompanied by no reason or an incorrect one was rated two; marked false and accompanied by a partially correct reason received three; and marked false and accompanied by a "correct" statement of the reason why the proposi-

tion was fallacious counted four points. The total possible score on Section II, therefore, was one hundred.

The students taking the course in the Principles of Economics were given the test in September, 1924, and the same test the following May, after pursuing the work three hours a week throughout the year. Neither the students nor the instructors were aware that the same test was to be given the second time, and therefore had no incentive for preparing especially for the second testing. Furthermore, the copies of the test were all collected in September and stored, so that there was no opportunity to see or discuss it in the meantime. The results on the final test give no evidence of any practice effect. The test was taken both times by 204 students in the regular course in Principles of Economics.

THE UNIVERSITY OF IOWA
GENERAL TEST IN ECONOMICS

School_____
Date given_____
Student's name_____
Student's age_____ years. Sex_____
Student's residence (mark with an x the description that fits best):
City_____ Village_____ Country_____
Occupation of student's father (or head of the family if head is not the father, or give business or industry which forms main source of family income if other than earnings of the head)_____
Political-party affiliation or preference of the family (mark an x):
Democratic_____ Republican_____ Socialist_____ Independent_____
Time of starting test_____
Time of finishing Section I and starting Section II_____
Time of finishing Section II_____

SECTION I (TIME: TEN MINUTES)

Below is a list of statements and questions. After each is a group of answers or clauses supplying the information asked for. In each case draw a line under the particular answer or expression which gives the best answer.

1. In what century did the Industrial Revolution begin?
   13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th
2. In what country did the Industrial Revolution begin?
   United States, England, France, Germany, Russia, Italy, Spain

3. What was the cause of the Industrial Revolution?
   Dissatisfaction of the working classes
   Discovery of a new country
   The invention of machinery
   The French Revolution
   The Crusades
   Improved transportation facilities

4. What is your estimate of the income of the people of the United States in 1923?

$ 100,000,000	$ 50,000,000,000
500,000,000	60,000,000,000
1,000,000,000	70,000,000,000
10,000,000,000	100,000,000,000
20,000,000,000	125,000,000,000
30,000,000,000	150,000,000,000
40,000,000,000	200,000,000,000

5. What percentage of the total income of the United States do you think goes to labor?
   10, 20, 30, 40, 50, 60, 70, 80, 90, 100

6. What percentage of the total income goes to property (of all kinds)?
   10, 20, 30, 40, 50, 60, 70, 80, 90, 100

7. What is your estimate of the value of all the property in the United States?

$ 100,000,000	$ 300,000,000,000
1,000,000,000	350,000,000,000
10,000,000,000	400,000,000,000
50,000,000,000	500,000,000,000
100,000,000,000	600,000,000,000
150,000,000,000	1,000,000,000,000
200,000,000,000	1,500,000,000,000
250,000,000,000	2,000,000,000,000

8. What sum per year most truly represents the minimum annual income necessary to maintain a family of father and mother and three children in an American city at a decent American standard of life?

$ 500	$2,500	$ 7,500
800	3,000	10,000
1,000	3,500	15,000
1,500	4,000	
2,000	5,000	

9. What percentage of American families receive enough or more than enough to support a family of five according to scientific estimates of the cost of a decent standard?
   0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

10. What percentage do you think receives half the above or less?
    0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
11. What is the most important reason for studying economics?
    To train the mind
    To learn to manage business and make money
    To learn to judge wisely on public questions
    To satisfy curiosity
    To be able to read the newspapers
12. What is the great advantage of division of labor in comparison with each person doing everything for himself?
    It makes work more interesting
    It increases the efficiency of effort
    It makes the worker more independent
    It develops personality
13. What is the correct standard to be used by an arbitration board in fixing wages?
    The amount of effort exerted by the worker
    The value of the results of the worker's services
    The amount required for a decent standard of living
    The amount the employer is able to pay
14. What is the main cause of the economic distress of the American farmer in the past year?
    Unrest and disorganization in Europe
    Unfair discrimination against the farmer in the supply of credit
    Too high wages in city industries in this country
    Overproduction of farm products
    Robbery by monopolistic control of other industries
15. The essential reason for taxing the rich proportionally more than the poor is that:
    The rich receive more benefit from the government than the poor
    The rich are better able to pay taxes than the poor
    The rich have acquired their wealth at the expense of the poor
    The rich cannot spend all their money wisely
16. The drastic taxation of inheritance is (the next question asks for the reason for your answer)
    A good social policy
    A bad social policy
17. The one decisive reason for my answer to question 16 is:
    The government needs the money with which to pay expenses.
    The government has the right to levy taxes on any form of wealth so long as it does not violate the constitution.

Those who inherit money have not earned it and ought to give part of it to society.

The government maintains the institution of private property and should therefore be allowed to regulate its transference.

Inheritance is an inviolable natural right.

Taxation of inheritances will discourage business activity and capital accumulation.

The tax will be evaded by gifts of owners to prospective heirs during the life of the former.

Even if children do not have the right to inherit, the owners have the right to bequeath.

18. The largest division of industry in the United States from the standpoint of the value of the product created is:
    - Transportation
    - Agriculture
    - Mining
    - Manufactures
    - Banking and finance
    - Merchandising and trade

19. The most important source of revenue for the federal government is:
    - Personal income tax
    - Excise and stamp tax
    - Corporation income tax
    - Tariff tax
    - Inheritance tax
    - Taxes on property

20. The most important source of revenue for state and local government is:
    - License fees
    - Taxes on property
    - Taxes on income
    - Inheritance taxes
    - Corporation taxes

21. The most important expense of the national government is:
    - The public buildings and improvements
    - Army and navy
    - Cost of government departments (Congress, president, federal courts, diplomatic and consular offices, commissions, etc.)
    - Post-office (net cost)
    - Education

22. The most important expense of state and local government is:
    - Justice (the courts and expenses of officials)
    - Commission, etc.

Education
Roads
Public institutions, charities, etc.

23. In a corporation the first claim on earnings rests with the owners of:
Preferred stock
Bonds
Common stock

24. The first claim on assets, if the business fails, rests with owners of:
Preferred stock
Bonds
Common stock

25. The control of a corporation (through election of directors) rests generally in the hands of owners of:
Preferred stock
Common stock
Bonds

SECTION II (TIME: THIRTY MINUTES)

Instructions: Read each of the following statements carefully and make up your mind whether it is true or false. If it is true underline the word "true"; if it is false underline the word "false" and state briefly why it is false. (The essential fallacy in every proposition that is false can be clearly indicated in *one sentence.*) No credit is given for marking a proposition false even when it is false unless the reason is stated.

1. The stamp of the government on a coin or bill is what determines its value.
True
False, because

2. A person's scale of living depends upon the amount of wealth he owns.
True
False, because

3. If the wages of any important class of workers are below requirements for a decent standard of living, it would be possible by law to raise them to any desirable level (constitutional difficulties disregarded).
True
False, because

4. There is no real conflict of interest between employers and the wage-earners, and the only way to benefit the poor is to make business more profitable.
True
False, because

5. Merchants and middlemen are unproductive; they merely levy a toll on producers and consumers.
   True
   False, because

6. The monopolist charges for his product the highest price which he can get.
   True
   False, because

7. The price of farm products ought to be high enough to yield a reasonable return on the value of the land in addition to other costs of production.
   True
   False, because

8. The price at which this year's wheat crop will sell will be determined by what it has cost to produce it.
   True
   False, because

9. If it is more profitable to use grain to make whiskey than for any other purpose, this indicates the socially most desirable use of grain, and the prohibition of the manufacture of whiskey is unwise.
   True
   False, because

10. Mr. A. worked hard and lived frugally and left a substantial fortune to his son. The son spent the money for luxury and amusement and was reduced to poverty. Though our sympathies may be aroused by the young man's change in circumstances, yet it is a good thing for the country to have this wealth put into circulation.
   True
   False, because

11. The great Japanese earthquake was an economic benefit to Japan since it created a lively demand for labor and materials.
   True
   False, because

12. By passing laws and enforcing heavy penalties the government could prevent the price of any commodity from rising higher than any amount decided upon as reasonable.
   True
   False, because

13. It may be wise for the government to build waterways which it would not pay a private corporation to construct, since the government does not need to make interest on the investments.
    True
    False, because

14. Education and public health ought not to be supported at government expense. They are no more important than food and clothing, and, as in the case of other goods, their production and distribution should be left to the control of the market demand.
    True
    False, because

15. Mr. Edison was right in contending that the government should not make the people pay taxes, nor borrow from the capitalists and tax the people to pay them interest, but should get rid of the burden by printing paper money and using this to pay its expenses.
    True
    False, because

16. When prices are rising, as during the world-war, merchants should sell goods already stocked at the usual margin above original cost. To mark them up merely because they have risen since the merchant made his purchase is illicit profiteering.
    True
    False, because

17. Excessively high interest rates arise from the shortage of money and are to be dealt with by measures designed to increase the supply of money and bank credit.
    True
    False, because

18. Estimates of the national loss from destruction by fire need to be discounted if they are not to be misleading, since most of this loss is covered by insurance.
    True
    False, because

19. To pay off the national debt too rapidly would hamper business for funds, since the money has to come out of productive business through taxation in some form.
    True
    False, because

20. A protective tariff is a good thing for the country, even if it does make consumers pay somewhat more for goods, for, if Americans buy European products, America has the goods and Europe has the money; but if Americans buy American goods, America has the goods and the money both.
    True
    False, because

21. The correct and scientific principle for fixing tariffs is to make them equal to the difference between the cost of production to the American and the foreign producer.
    True
    False, because

22. The United States imports many millions of dollars worth of merchandise each year from Brazil, and exports relatively little to that country. This being so, the trade tends to enrich Brazil and impoverish the United States.
    True
    False, because

23. It is wrong for persons who do not need the money to earn wages or salaries—as is often done by daughters of well-to-do families, for example—for this means less work for those who really need it.
    True
    False, because

24. The word "monopoly" means a large and powerful corporation.
    True
    False, because

25. There is no reason why the government should fix railway rates for hauling freight and passengers which would not also justify it in regulating the price at which bakers sell their bread or shoe manufacturers their shoes.
    True
    False, because

II. THE RESULTS OF THE TEST AS A WHOLE

The results of the test are presented in Tables I and II. The individual scores on each question of the test were tabulated for both testings and the character of the answers was noted. Table I shows that student No. 2 made the same score on nineteen of

the questions of Section I both times he took the test; that is, of these nineteen questions, those he answered correctly in Sep-

TABLE I*

Student No.	Unchanged Answers	Improved Answers	Worsened Answers	Initial Score	Final Score	Gain	Grade	Intelligence Score
2.....	19	3	3	16	18	2	D	95
25.....	17	8	0	8	18	10	B	98
75.....	18	5	2	8	11	3	D	41
125.....	17	5	2	8	10	2	C	.....
175.....	20	2	3	15	18	3	C	.....
Mean.....	17.3	5.1	2.6	12.1	14.8	2.7	.....	50.7
S.D.....	2.6	2.6	1.8	2.5	2.6	5.7	.....	29.1
P.E.M.....	.12	.12	.08	.12	.12	.27	.....	1.38

* Showing for Section I the number of unchanged answers, the number of improved answers, the number of answers poorer on the final than on the initial test, the scores on the initial and on the final test, the gain for each student, the grade received at the end of the second semester, and the composite percentile intelligence score made by the students on the Freshman Examination given to Freshmen by the State University of Iowa in September, 1923. Only five of the 204 cases studied are shown in Tables I and II.

In cases where no "intelligence" score appears in this table and in Table II, the student did not take the Freshman Examination. This occurred in 65 of the 204 cases.

SUMMARY OF TABLE I*

Students		Unchanged Answers	Improved Answers	Worsened Answers	Initial Score	Final Score	Gain	Intelligence Score
Boys with previous training in economics (122 cases)	Mean	16.7	4.9	2.7	12.3	14.7	2.4	58.1
	S.D.	2.4	2.3	1.7	2.4	3.0	3.3	26.3
	P.E.M.	.15	.14	.10	.15	.18	.20	1.6
Boys with no previous training in economics (47 cases)	Mean	16.5	5.5	2.5	11.7	15.0	3.3	57.5
	S.D.	2.9	3.0	1.8	2.9	3.0	4.0	31.5
	P.E.M.	.28	.29	.18	.28	.29	.39	3.06
Girls with previous training in economics (24 cases)....	Mean	17.7	4.9	2.3	12.0	14.9	2.9	†
	S.D.	2.7	2.6	1.4	2.8	2.0	3.1	†
	P.E.M.	.37	.36	.20	.38	.28	.42	†
Girls with no previous training in economics (11 cases)	Mean	17.1	5.4	2.6	11.4	14.8	3.4	†
	S.D.	1.9	1.6	1.1	2.0	2.2	2.7	†
	P.E.M.	.39	.32	.22	.41	.45	.54	†
Totals (204 cases).....	Mean	17.3	5.1	2.6	12.1	14.8	2.7	50.7
	S.D.	2.6	2.6	1.8	2.5	2.6	3.7	29.1
	P.E.M.	.12	.12	.08	.12	.12	.27	1.38

* Owing to the small sampling necessitated by lack of space, the analysis of the data as shown in the summaries of Tables I and II could of course not be shown in the tables themselves.

† These data are omitted, as the number of cases in each instance was too small to make the results of any value. This is true also for the summary of Table II.

tember he answered correctly in May, and those he failed to answer correctly in September he answered incorrectly in May. On three questions he showed improvement, while three questions

TABLE II*

Student No.	Unchanged Answers	Improved Answers	Worsened Answers	Initial Score	Final Score	Gain	Grade	Intelligence Score
2.....	11	9	5	34	52	18	D	95
25.....	9	12	4	44	59	15	B	98
75.....	16	7	2	26	36	10	D	41
125.....	11	8	6	37	39	2	D	.....
175.....	13	10	2	34	57	23	C	.....
Mean.....	12.5	8.5	4.0	35.6	46.3	11.2	.....	50.7
S.D.....	2.6	2.7	2.6	8.7	10.4	9.5	.....	29.1
P.E.M.....	.12	.12	.12	.41	.49	.45	.....	1.38

* Showing for Section II the number of unchanged answers, the number of improved answers, the number of answers poorer on the final than on the initial test, the scores on the initial and on the final test, the gain for each student, the grade received at the end of the second semester, and the composite percentile intelligence score made by the students on the Freshman Examination given to Freshmen by the State University of Iowa in September, 1923.

SUMMARY OF TABLE II

Students		Unchanged Answers	Improved Answers	Worsened Answers	Initial Score	Final Score	Gain	Intelligence Score
Boys with previous training in economics (122 cases)	Mean	12.5	8.5	4.1	36.1	47.6	11.5	58.1
	S.D.	3.6	2.5	2.7	8.8	10.8	10.3	26.3
	P.E.M.	.22	.17	.16	.54	.67	.61	1.60
Boys with no previous training in economics (47 cases)	Mean	12.4	8.3	3.8	35.5	47.9	12.4	57.5
	S.D.	3.0	3.0	2.2	8.7	9.8	9.5	31.5
	P.E.M.	.29	.29	.22	.85	.95	.92	3.06
Girls with previous training in economics (24 cases)	Mean	12.6	8.3	4.0	32.5	43.3	10.8	.....
	S.D.	2.8	2.8	2.9	9.3	12.6	9.1	.....
	P.E.M.	.38	.38	.40	1.28	1.76	1.28	.....
Girls with no previous training in economics (11 cases)	Mean	12.8	8.4	3.8	32.1	41.4	9.3	.....
	S.D.	1.8	2.6	2.2	6.3	8.2	7.8	.....
	P.E.M.	.37	.53	.45	1.29	1.67	1.59	.....
Totals (204 cases)	Mean	12.5	8.5	4.0	35.6	46.8	11.2	50.7
	S.D.	2.6	2.7	2.6	8.7	10.4	9.5	29.1
	P.E.M.	.12	.12	.12	.41	.49	.45	1.38

which he answered correctly in September he answered incorrectly in May. His initial score was sixteen out of a possible twenty-five, and his final score was eighteen, a net gain of two

points. He received a grade of D in his work in the course in Principles of Economics at the end of the second semester and made a score of 95 on the basis of 100 on the University of Iowa Freshmen Examination in September, 1923.

Referring to the totals in the summary of Table I, we find an average of 17.3 answers of the twenty-five in Section I unchanged on the second testing. An average of 5.1 answers were improved and 2.6 were changed from right to wrong on the final testing. The net gain was 2.7.[1]

The summary of Table II gives, for Section II of the test, information corresponding to that given for Section I in the summary of Table I. Referring again to the totals, we see that of the twenty-five answers 12.5 were the same on the final as on the initial test. Improvement was made on 8.5 answers, and 4.0 were answered less satisfactorily on the final than on the initial test. The net gain in the total score was 11.2.

To summarize briefly, improvement is shown on both parts of the test. There is at present no basis for evaluating quantitatively the amount of economic knowledge gained during the year, but the test indicates that students are able to answer questions of the type used in the test better at the end than at the beginning of the year. The amount of retrogression (worsened answers), however, is surprising. An analysis of the shifting of answers on the two applications of this test affords an interesting study. Much of this shifting is doubtless due to guessing, but it cannot all be explained on this basis. The multiple-choice form of Section I reduces materially the possibility of guessing the correct answer, while on Section II the requirement that the student support his judgment by brief statements would tend to some extent at least to prevent guessing. While, therefore, some of the shifting was undoubtedly due to guessing, part of it can apparently be explained only on the ground that the student forgot during the year facts that he knew at the beginning, and that his judgment on certain economic situations

[1] The difference between 5.1 and 2.6 is, of course, 2.5, and not 2.7. The discrepancy is explained by the fact that half-scores were given in some instances, and for the purposes of this summary these half-points were treated as whole units.

was rendered less sound. Theoretically neither of these things should happen when it is remembered that the student was regularly attending classes where the material on which the test was based was constantly under discussion and that he was using texts and other material in which economic information and exposition were clearly set forth. The prevention of these negative reactions would be a decided gain in the teaching of the subject.

The question as to the value of a preliminary course in economics to those who take the work in principles has often been raised. In so far as this test is a measure of achievement in economics, the student who expects to pursue a course in the principles of economics does not profit by the preliminary work either in high school or college. Leaving out of consideration the girls, since the number of cases with no previous training is too small to be conclusive, it appears from Table I that those who have had no previous economics course begin the work in principles with slightly less knowledge of economic facts than those who have had preliminary work, but that this handicap is more than overcome by the end of the year. The same conclusion holds with reference to Section II. A student, therefore, who expects to take the course in principles in college had better not take the usual preliminary work offered either in high school or college. He can spend his time to better advantage studying something else.

Comparison between the performance of the boys and the girls indicates that on Section I, which asks chiefly for economic facts, the girls do about as well as the boys. On Section II, however, the boys are clearly superior.

A number of correlations were computed for the purpose of comparing the results obtained by the test with other important data for the students tested. The results are listed on page 759.

Before commenting on the correlations it may be well to say a word with reference to the reliability of the criteria used. The "intelligence" score is the composite percentile score made by the students in the beginning of their Freshman year at the university of Iowa. This score is based upon three tests, namely, the Thorndike Intelligence Examination, the Ruch High-School

Content Examination, and the Iowa Comprehension Test.[2] Such a combination of tests is doubtless valuable for certain purposes, but is too general in content to yield results that could be expected to correlate highly with any type of specialized ability. The results from these tests were the best available means of judging the students' general educational ability, and were therefore used.

The grades received by the students for their work in the second semester of the course in economics were also used for correlation purposes. These were probably even less reliable than the intelligence examination. The students remaining at the end of the second semester were those who had succeeded in weathering the storm of the first and were almost predestined to receive a passing grade. As a matter of fact only one failure was recorded out of 204 cases. Four students were conditioned and these were treated as failures in the correlations. Two were marked incomplete. The remainder were thrown roughly into a normal distribution as is required by the regulations of the faculty on this point. Numerous other considerations enter into the grading of the student which tend to increase the unreliability of grades for comparative purposes. Some basis or bases of comparison, however, must be employed to make results intelligible or useful, and these are practically the only ones available to the investigator.

A word of comment on the correlations obtained may not be out of place. None of the correlations is high. Section I gives no correlation with any of the criteria chosen high enough to be of any appreciable significance. Considering the instability of the grades given by the instructors, the correlation of .34 between the final scores, Section I, and the grades may be of some import as showing relation between success on the test and in the college course. The time given to this division of the test—ten minutes—was too short to produce results of great significance, even if the other factors had been favorable.

[2] A description of these tests may be found in G. M. Ruch, *A Mental-Educational Survey*, "University of Iowa Studies, Studies in Education," II, No. 5 (December 1, 1923), 7.

The correlation (.17) between the initial and the final scores, Section I, is too low to indicate anything except perhaps that the student's performance at the end of the year cannot be predicted from his initial score. This is not an unreasonable deduction in view of the fact that the material of Section I was largely factual and required no great amount of native ability for its mastery. A high final score on this division of the test was a result of study rather than of native intelligence. This conclusion is supported by the practical absence of correlation between the gain on Section I and the intelligence score.

The correlations computed on the basis of the scores of Section II are considerably higher than those of Section I. The time occupied by this part of the test was thirty minutes, as compared with ten minutes by Section I. The correlation of .56 between the initial and the final scores of Section II is the highest and indicates some "predictive power." The correlations with intelligence and grades are low, but are not negligible. The correlation of .43 with grades is about as high as one could expect in view of the circumstances. Section II may be said to have a fair degree of reliability for the purpose for which it was intended.

CORRELATIONS

	r	P.E.
Initial and final scores, Section I	.17	.05
Intelligence and initial scores, Section I	.23	.05
Intelligence and final scores, Section I	.21	.05
Intelligence and gain, Section I	—.06	.06
Initial and final scores, Section II	.56	.03
Intelligence and initial scores, Section II	.13	.05
Intelligence and final scores, Section II	.36	.05
Intelligence and gain, Section II	.16	.06
University grades and initial scores, Section I	.18	.05
University grades and final scores, Section I	.34	.04
University grades and initial scores, Section II	.28	.04
University grades and final scores, Section II	.43	.04

III. THE RESULTS OF THE TEST BY QUESTIONS

One of the most important conditions of efficient teaching is a knowledge of the student's reactions to the subject matter to be

learned. It often happens that, owing to lack of insight on the part of the teacher into these reactions, his efforts at presenting his subject are misdirected or are spent in expounding matters with which the student is already familiar. If the teacher could know the condition or state of the student's mind or the extent of his knowledge of the particular item he is trying to teach—if, in other words, he could foresee the errors in thinking which need to be corrected—his efforts could be expended far more economically and efficiently than is possible when these conditions are absent.

This is especially true of the subject of economics. The student has been the object of economic forces ever since the day of his birth. He has formed a "mental set" toward economic questions. He has learned the stock phrases and expressions used by his parents, the chamber-of-commerce speaker, the politician, and the newspaper. He thinks he knows a good deal about the subject to begin with, and often needs to be born again economically before he can pursue a course of study in economics with any appreciable degree of profit.

The present study has afforded an opportunity for discovering what the student in the University of Iowa thinks about economic questions and how he expresses himself about them. The material of the test, especially Section II, touches most of the important economic questions and problems not only of today but of the past and presumably of the future. A knowledge of the student's reactions toward these problems, of his method of reasoning about them, and of the effect of his environment on his views should be of aid to the teacher in approaching the subject and in clearing away obstacles that have always been present.

With this thought in mind the individual answers of the students to the questions of both sections of the test were carefully checked and tabulated. Space does not permit a complete presentation of the results of this analysis. A few samples only are set forth here.

SECTION I

Question 1.—In what century did the Industrial Revolution begin?
Answer.—The eighteenth.

Incorrect answers:

	Initial	Final
13th century	2	2
14th century	8	6
15th century	17	20
16th century	45	28
17th century	29	35
19th century	21	18
20th century	2	..
Total number incorrect	124	109
Correct answers	80	95
Total	204	204
Average score for question 1	.36	.45

The figures show that few of the students learned the century when the Industrial Revolution began. The number who answered correctly on the final was only fifteen greater than the number who answered correctly on the initial test. This is true despite the fact that the text contains four chapters on economic history.

Questions 5 and 6: These questions ask for the percentage of income that goes to labor and property, respectively. Estimates between 60 and 70 per cent for labor and 40 and 30 per cent for property were given a score of 1, providing the sum totaled 100 per cent. Otherwise no credit was given.

Reference to Table III shows a slight decrease in the final score on both these questions. This does not necessarily mean that the students knew less at the end than at the beginning. The low scores on both tests and the shifting of answers indicate that the scores are largely the result of guesses rather than of positive knowledge. The students guessed better on the initial test.

The question of national income was discussed at length in class. While the division of income between labor and property

was probably made in no instance, sufficient information is given in the text and was brought out in class to have enabled the student on the final test readily to make a fairly close estimate of the share received by each social group. The answers, however, were little better than wild guesses. If this information is

TABLE III*

Questions (Number)	Unchanged Answers	Improved Answers	Worsened Answers	Initial Average Score	Final Average Score	Gain
1	134	45	25	.36	.45	.09
2	182	22	0	.80	.97	.17
3	147	47	10	.69	.87	.18
4	140	42	22	.49	.60	.11
5	163	17	24	.16	.12	−.04
6	168	21	15	.12	.11	−.01
7	125	55	24	.14	.26	.12
8	168	21	15	.74	.84	.10
9	126	36	42	.33	.26	−.07
10	142	30	32	.27	.25	−.02
11	147	36	21	.72	.78	.06
12	184	18	2	.91	.97	.06
13	129	22	53	.50	.35	−.15
14	133	55	16	.27	.51	.24
15	150	47	7	.72	.90	.18
16	159	23	22	.81	.83	.02
17	140	34	30	.40	.40	0
18	163	30	11	.50	.68	.18
19	128	51	25	.26	.44	.18
20	160	29	16	.85	.90	.05
21	92	105	7	.35	.81	.46
22	118	59	27	.43	.63	.20
23	142	43	19	.21	.36	.15
24	104	79	21	.37	.66	.29
25	112	80	12	.26	.61	.35
Mean	142.2	41.8	19.9	.45	.58	.13

* Showing the number of unchanged answers, the number of improved answers, the number of answers poorer on the final than on the initial test, the average scores on the initial and on the final test, and the gain for each question of Section I.

worth having it should be presented in such a way as to enable the student to adapt it to any use he may have for it. A considerable number of students doubtless knew the facts as to the number of wage-earners, the average income of each, and the total estimated income of the United States. By combining this information in the right way, answers to questions 5 and 6 could have been worked out with sufficient accuracy to answer the purpose.

Question 11.—What is the most important reason for studying economics?

Answer.—To learn to judge wisely on public questions.

Incorrect answers:

	Initial	Final
1. To train the mind	28	35
2. To learn to manage business and make money	23	6
3. To satisfy curiosity	..	1
4. To be able to read the newspapers	..	1
Total incorrect answers	51	43
Correct answers	150	158
Omitted answers	3	3
Total	204	204
Average score for question 11	.72	.78

The figures show that a considerable majority of the students at the beginning of the course were able to discriminate wisely in their choice of reasons why economics is—or should be—studied. Little net gain resulted from the course. Reference to Table III will show that whereas thirty-six who answered incorrectly on the first test answered correctly on the second, twenty-one who answered correctly on the first answered incorrectly on the second. The latter evidently had no real convictions, but answered more or less at random. It is interesting to note that of the twenty-three who believed at first that the purpose of studying economics was to learn to make money, only six remained at the end of the year. This is a clear indication that the teaching done along the line of socializing the student has some results. The increase in the number of those who believe that the main purpose of studying economics is to train the mind may be viewed from two sides. First, these thirty-five may be looked upon as having failed to be reached by the efforts of the instructors to set forth the true purpose of the subject, or, second, they may have been unduly impressed by the rigor of the mental exercise involved in mastering it.

SECTION II

All the propositions in Section II of the test are false. An answer that was considered an adequate refutation of the particular fallacy involved was given a score of four. An answer that was partially correct, i.e., one which recognized the proposition involved as false and partly, but not fully, pointed out the reason why it could not be true, was given a score of three. A proposition recognized as false but not supported by any reason or accompanied simply by an assertion, an irrelevant statement, or an incorrect reason was given a score of two. A question omitted was given a score of one. A proposition marked true was given a zero score. The reason for the latter two scores was the desire to distinguish between an omitted answer and a "true" answer, and also to eliminate scores due to guessing, and at the same time to avoid negative scores. Subtracting the number marked true from the total score would have eliminated the guessing element but would have resulted in negative scores in some cases.

The types of incorrect answers given by the students on Section II are shown. Letters and numbers are used to designate particular answers. A large number of answers were pure assertions which expressed merely the opinions of the students and presented no argument. These are designated by the letter *a*. An equally large number are irrelevant. These are designated by the letter *i*. Others were just nonsense and are indicated by the letter *n*. Some answers would fit into any or all of these categories. No attempt has been made at a rigid classification, as this was felt to be unnecessary for the purpose in hand.

The different incorrect answers to each question were numerous. An attempt has been made roughly to classify them. Each type of answer for each question (proposition) is indicated by a number.

There would doubtless be disagreement as to the value of many of the answers to the propositions of this section. Persons trained in economics are by no means agreed as to the correct or incorrect answers. No attempt has been made in this presentation to justify the treatment accorded any of the answers, as it was felt to be futile. The best judgment of the writer and his

associates has been used in scoring the test after carefully weighing the many possible variations. That the scoring on this basis has been fairly consistent is shown by the fact that on the independent readings of three teachers of economics of answers to Section II given by twenty-six students, correlations of .945, .917, and .903 were obtained. The matter of wording the propositions so as to avoid ambiguity caused a great deal of difficulty. Even after repeated changes some of the propositions may still be improved in this respect. One of the inherent difficulties in constructing a test in the ability to reason about economic questions is the difficulty in saying what is meant in words that the reader cannot fail to understand.

As in Section I, a few of the twenty-five propositions are given.

Proposition 3.—If the wages of any important class of workers are below requirements for a decent standard of living, it would be possible by law to raise them to any desirable level (constitutional difficulties disregarded.)

Answer.—Arbitrarily raising wages beyond the amount contributed to the product by the worker would bankrupt the employer and throw the employees out of work.

Samples of partially correct answers:

It may not be able to pay the man more salary.

There might be more people than work, and hence it would be impossible to keep up wages.

Wages depend on the business itself.

No one could compel the employer to pay more than they are worth economically.

People would refuse to pay a higher price for the commodity produced if the commodity was not valuable.

Wages depend on prices, production, etc.

The laborers cannot receive more than they add to the product.

Types of incorrect or inadequate answers:

1. Prices would go up.
2. Supply and demand determine prices.
3. Would cause unrest and dissatisfaction.
4. Standard of living must be brought about by education.
5. The legislation would cause another group to suffer.
6. The state (now) regulates wages to a certain extent.
7. Not any desirable. It could raise them somewhat.
8. Miscellaneous.

SUMMARY

Marked False, with incorrect or inadequate reason given:

	Initial	Final
a	24	31
i	29	29
n	3	2
1	3	3
2	9	14
3	3	1
4	2	..
5	1	..
6	1	..
7	1	..
8	..	5
Total	76	85
Correct, partially correct, false with no reason, or omitted	28	46
Marked True	100	73
Total	204	204
Average score (of possible 4)	1.10	1.51

Proposition 20.—A protective tariff is a good thing for the country even if it does make consumers pay somewhat more for goods, for, if Americans buy European products, America has the goods and Europe has the money; but if Americans buy American goods, America has the goods and the money both.

Answer.—Foreign trade is an exchange of goods for goods, not goods for money, as this statement implies.

Samples of partially correct answers:

The countries exchange goods, and money is received by both countries.

Protective tariffs shelter unprofitable industries.

A balance of trade is kept between countries.

Foreign nations will buy equally as much from America as she does from them, and the tariff merely increases the price she must pay.

Commerce in the main is not a transaction of dollars and cents.

Types of incorrect and inadequate answers:

1. The country will lose because only a few will profit.
2. What money we lose by importing we gain by exporting.
3. We profit by trade; if we do not trade with foreign countries they are not apt to trade with us, thus a loss resulting to both parties.

4. If we buy from some other country we have our own goods besides as much more from the other country.
5. Miscellaneous.

SUMMARY

Marked False with incorrect or inadequate reason:

	Initial	Final
a	20	72
i	16	29
n	4	4
1	1	..
2	..	1
3	..	5
4	..	1
5	1	4
Total	42	116
Correct, partially correct, false with no reason, or omitted	20	28
Marked True	142	60
Total	204	204
Average score	.58	1.52

The gain in average score resulted not so much from a grasp of the principle involved in this proposition as from the mere recognition that it is a fallacy. From 142 who regarded it as true on the intial test the number fell to 60 on the final test.

Proposition 24.—The word "monopoly" means a large and powerful corporation.

Answer.—The word means simply control of supply, but usually implies also the control of price.

Samples of partially correct answers:

Monopoly means control of an article.
Monopoly means the right to set the price.
A monopoly can control supply and demand.
A man holding a patent has a monopoly.
Monopoly means limitation of output.

Types of incorrect or inadequate answers:

1. Monopoly means cornering some commodity.
2. Monopoly is a group of corporations working together.
3. Monopoly means a business commanded by one head or heads.
4. Monopoly means unfair competition.
5. Miscellaneous.

SUMMARY

Marked False, with incorrect or inadequate reason:

	Initial	Final
a	59	50
i	6	1
1	2	1
2	1	..
3	1	..
4	1	..
5	4	3
Total	74	55
Correct, partially correct, false with no reason, or omitted	93	129
Marked True	37	20
Total	204	204
Average score	1.92	2.77

SUMMARY

From Table IV it is seen that the mean average gain on Section II was .49 on a base of 4. On the intial test a total of 366 answers were given a perfect score while on the final test there were 687 perfect answers, a gain of 321. The total number of answers (204×25) was 5,100. Of the 5,100 answers, 1,958 were "true" on the initial and 1,400 were "true" on the final test, a decrease of 558.

It will thus be seen that the year's work in the principles of economics, as measured by this test, resulted in a positive gain. Whether this gain is as large as it should be it is impossible to say with assurance in view of the fact that no basis of comparison is available. To the writer it appears too small when the amount of time spent in studying the material on which the test is based is considered. The propositions in Section II are glaring fallacies to one familiar with the principles underlying the science of economics, and yet on an average more than one-fourth of them were taken to be true at the close of the year's work. Of the "false" answers, 1,686 were supported on the initial test by reasons considered incorrect or inadequate, and on the final test the number was 1,646. It appears, therefore, that little of the

gain made on the test was the result of improved ability to state why the propositions were fallacious.

In view of the fact that the purpose of studying economics is to increase one's ability to think clearly on economic questions,

TABLE IV*

Questions (Number)	Unchanged Answers	Improved Answers	Worsened Answers	Initial Average Score	Final Average Score	Gain
1	83	78	43	1.14	1.57	.43
2	110	59	35	1.24	1.58	.34
3	85	81	36	1.10	1.51	.41
4	80	83	41	1.60	2.01	.41
5	101	75	38	1.73	2.48	.75
6	46	141	17	.89	2.70	1.81
7	166	26	12	.15	.30	.15
8	155	43	26	2.69	2.78	.09
9	92	83	29	2.03	2.38	.35
10	96	71	37	1.06	1.57	.51
11	115	69	20	1.53	2.05	.52
12	82	80	42	.98	1.59	.61
13	94	62	48	.91	1.26	.35
14	111	62	31	2.25	2.47	.22
15	116	69	19	2.50	2.84	.34
16	117	62	25	1.80	2.44	.64
17	132	45	27	.39	1.28	.89
18	87	54	63	2.18	2.25	.07
19	143	37	24	.24	.45	.21
20	84	105	15	.58	1.52	.92
21	119	32	53	.66	.56	—.10
22	75	100	29	1.83	2.56	.73
23	109	55	40	1.52	1.66	.14
24	69	109	26	1.92	2.77	.85
25	91	84	29	1.78	2.34	.56
Mean	101.5	70.6	31.9	1.39	1.88	.49

* Showing the number of unchanged answers, the number of improved answers, the number of answers poorer on the final than on the initial test, the average score on each question of the initial and of the final test, and the gain for each question of Section II.

Table IV is to be read as follows: On question No. 1, 83 students gave the same answer on both tests; 78 improved their answers; and 43 gave a poorer answer on the final than on the initial test. If all the students had answered the question correctly, the average score would have been 4. Actually the average initial score was 1.14 and the final score was 1.57, a gain of .43.

and since these propositions are presumed to be representative of the outstanding fallacies prevalent in the popular mind, it seems to the writer that the course in the principles of economics is not accomplishing its purpose as fully as could be desired. Several reasons might be adduced as to why this is true. In the first place, the subject matter comprising the science of economics is abstract and difficult for the beginner to understand. As stated previously, the student upon entering the course in

principles is full of preconceptions and naïve to the extreme. He is accustomed to take economic phenomena more or less for granted, never stopping to ponder upon the underlying causes or principles of the activity he sees going on about him. He cannot see the economic woods for the trees. The chief object of the course in principles, in the opinion of the writer, should be to teach students to view economic activities in the light of their underlying social significance rather than from the individual or class standpoint. The reason, for example, why the tariff receives such widespread approval on the part of the students in the course in principles is that they fail to make a distinction between the benefit derived by a certain class or classes and that of the nation (or world) as a whole. When they talk or think of the advantage of "putting money into circulation" they are thinking of the advantage to the individuals who receive the money involved in the particular transaction, and not of the deeper meaning to society as a whole. The ability to think in social (general or abstract) terms about economic activities seems to be exceedingly difficult for the beginner to acquire, but without it he can never succeed in "judging wisely on public questions."

A second reason for failure to show greater progress is believed to be the attempt to cover too much ground in the course. The texts are usually large, bulky volumes filled with facts and exposition. Such at least is the text used by the group whose performance is set forth herein. There simply isn't time in a year's three-hour course for the ordinary student to assimilate the mass of material presented. Instead of trying to give the students in the principles course a smattering of all the later specialized courses in the field of economics, it would seem wiser to confine the work of this course to a consideration of actual principles and problems and to use only such economic facts as are necessary thereto.

On the students themselves doubtless rests part of the responsibility for mediocre results. The average Sophomore is not especially noted for his thirst for knowledge of economics or of any other academic subject. To do well in this course requires

close application and study. This is something the average modern student seems to try to avoid as much as possible. If some way could be found to motivate the work—to make it more interesting, to use the language so familiar in recent years to the ears of the pedagogue—greater progress could doubtless be made. But the greatest possibilities seem to lie in a revision of the course to a point where it will cease being a general repository of economic knowledge and become a body of material with a specific purpose in view, namely, to teach the *principles* of economics.

SUMMARY OF CONCLUSIONS

1. As measured by the test used, students of Principles of Economics at the University of Iowa begin the course with a considerable fund of knowledge of economic facts and make a small gain in such knowledge during the year. They make no improvement in ability to answer questions about material which is not specifically taught in class and with which they do not come into contact in other courses or in their general reading.

2. As measured by the test used, students in the University of Iowa, as a result of a year's work in economics, increase their ability to reason on economic questions, but not to the extent that they are able unerringly to detect common fallacies. They show only a slight increase in ability to state concisely the reasons for the fallaciousness of unsound propositions.

3. The amount of apparent retrogression is nearly half as much as the improvement. Part of this retrogression, however, can doubtless be explained as being due to guessing.

4. The fact that a student has had a course in economics in high school or in the university or both does not help him in answering questions on a general test such as was used in this study.

5. Students whose parents live on farms are no more disposed to blame non-agricultural groups for the recent economic distress of the farmer than are students who live in town. Those who are disposed to do so are as ready to accept arguments in

contradiction of their views as are the students whose interests are not primarily agricultural.[3]

6. It is the opinion of the writer, based upon a careful analysis of the results of the test, that the course in the Principles of Economics could be improved by a reduction in the amount of "survey" material and an increase in the number of concrete economic problems.

7. The results obtained on the test did not yield high correlations with the grades given by the instructors at the end of the year or with the "intelligence" scores made by the students on the Freshman Examination given in September, 1923. This was probably due to the unreliability of both these criteria as well as the test itself. The correlation of .56 between initial and final scores of Section II (Sophomores) was the highest obtained for this group, and indicates possibility of predictive value.

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[3] This conclusion is based upon an analysis of the answers to question No. 14, Part I.